2STF1550
2STN1550

Low voltage high performance NPN power transistors

Preliminary Data

Features

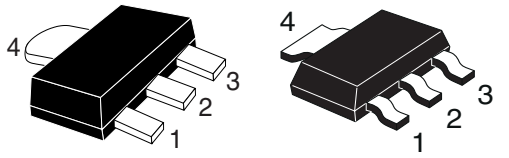
- Very low collector-emitter saturation voltage
- High current gain characteristic
- Fast switching speed
- Surface mounting devices in medium power SOT-89 and SOT-223 packages

Applications

- Emergency lighting
- LED
- Motherboard and hard disk drive
- Mobile equipment
- Battery charger
- Voltage regulation

Description

The 2STF1550 and 2STN1550 are NPN transistors manufactured using new “PB-HCD” (Power bipolar high current density) technology. The resulting transistor shows exceptional high gain performances coupled with very low saturation voltage.



SOT-89 SOT-223

Figure 1. Internal schematic diagram

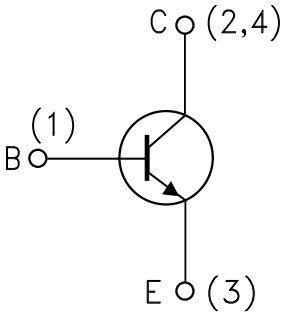


Table 1. Device summary

Order codes	Marking	Package	Packaging
2STF1550	1550	SOT-89	Tape and reel
2STN1550	N1550	SOT-223	

1 Electrical ratings

Table 2. Absolute maximum rating

Symbol	Parameter	Value		Unit
		2STF1550	2STN1550	
		SOT-89	SOT-223	
V_{CES}	Collector-emitter voltage (V_{CE} = 0)	50		V
V_{CEO}	Collector-emitter voltage (I_B = 0)	50		V
V_{EBO}	Emitter-base voltage (I_C = 0)	5		V
I_C	Collector current	5		A
I_{CM}	Collector peak current (t_P < 5 ms)	10		A
I_B	Base current	1		A
P_{TOT}	Total dissipation at T_{amb} = 25 °C	1.4	1.6	W
T_{stg}	Storage temperature	-65 to 150		°C
T_J	Max. operating junction temperature	150		°C

Table 3. Thermal data

Symbol	Parameter		SOT-89	SOT-223	Unit
$R_{thj\text{-}amb}$ (1)	Thermal resistance junction-amb	max	89	78	°C/W

1. Device mounted on PCB area of 1 cm^2

2 Electrical characteristics

(T_{case} = 25 °C unless otherwise specified)

Table 4. Electrical characteristics

Symbol	Parameter	Test conditions	Min.	Typ.	Max.	Unit
I_{CBO}	Collector cut-off current (I_E = 0)	V_{CB} = 50 V			0.1	µA
I_{EBO}	Emitter cut-off current (I_C = 0)	V_{EB} = 4 V			0.1	µA
$V_{(BR)CBO}$	Collector-base breakdown voltage (I_E = 0)	I_C = 100 µA	50			V
$V_{(BR)CEO}$ (1)	Collector-emitter breakdown voltage (I_B = 0)	I_C = 10 mA	50			V
$V_{(BR)EBO}$	Emitter-base breakdown voltage (I_C = 0)	I_E = 100 µA	5			V
h_{FE} (1)	DC current gain	I_C = 0.5 A V_{CE} = 2 V I_C = 2 A V_{CE} = 2 V I_C = 3 A V_{CE} = 2 V I_C = 5 A V_{CE} = 5 V	 135 100 	250 95	 400 	
$V_{CE(sat)}$ (1)	Collector-emitter saturation voltage	I_C = 3 A I_B = 300 mA		0.26	0.45	V
$V_{BE(sat)}$ (1)	Base-emitter saturation voltage	I_C = 3 A I_B = 300 mA		1	1.2	V
C_{CBO}	Collector-base capacitance (I_E = 0)	V_{CB} = 10 V, f = 1 MHz		20		pF
t_{on} t_{off}	Resistive load Turn-on time Turn-off time	I_C = 1.5 A V_{CC} = 10 V I_{B1} = -I_{B2} = 150 mA		 90 700		 ns ns

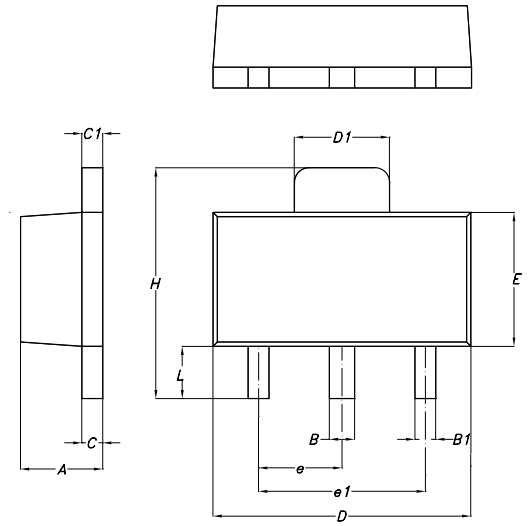
1. Pulsed duration = 300 µs, duty cycle ≤1.5%

3 Package mechanical data

In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a lead-free second level interconnect. The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: www.st.com

SOT-89 MECHANICAL DATA

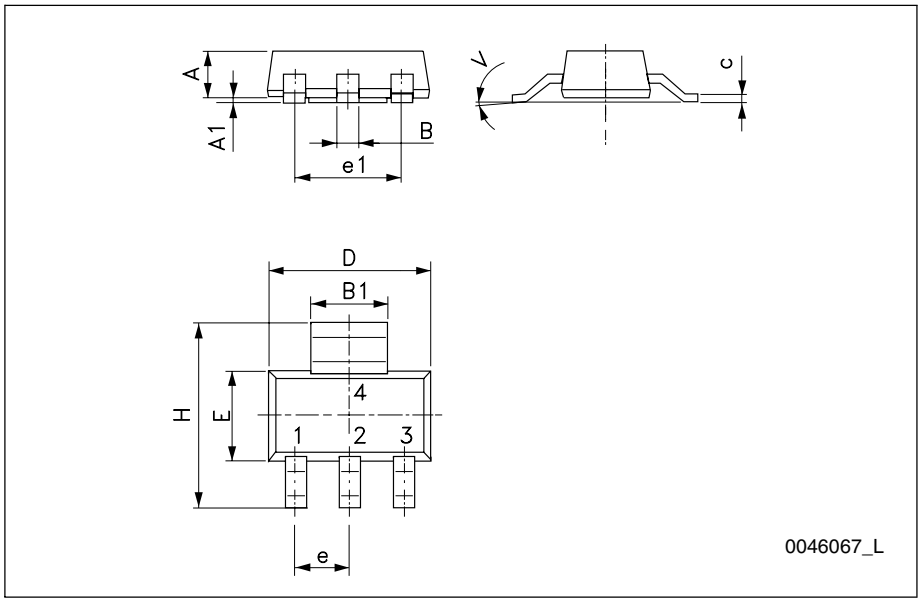
DIM.	mm			mils		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A	1.4		1.6	55.1		63.0
B	0.44		0.56	17.3		22.0
B1	0.36		0.48	14.2		18.9
C	0.35		0.44	13.8		17.3
C1	0.35		0.44	13.8		17.3
D	4.4		4.6	173.2		181.1
D1	1.62		1.83	63.8		72.0
E	2.29		2.6	90.2		102.4
e	1.42		1.57	55.9		61.8
e1	2.92		3.07	115.0		120.9
H	3.94		4.25	155.1		167.3
L	0.89		1.2	35.0		47.2



P025H

SOT-223 mechanical data

DIM.	mm.		
	min.	typ	max.
A			1.80
A1	0.02		0.1
B	0.60	0.70	0.85
B1	2.90	3.00	3.15
c	0.24	0.26	0.35
D	6.30	6.50	6.70
e		2.30	
e1		4.60	
E	3.30	3.50	3.70
H	6.70	7.00	7.30
V			10 °



4 Revision history

Table 5. Document revision history

Date	Revision	Changes
08-May-2007	1	Initial release
12-Nov-2008	2	Updated SOT-223 mechanical data

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